

EFFECT OF AEROBIC EXERCISE AND WEIGHT TRAINING ON SELECTED PHYSIOLOGICAL AND ANTHROPOMETRIC VARIABLES AMONG SCHOOL OBESE STUDENTS

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ABSTRACT

The purpose of the study was to analyse the effect of aerobic exercise and weight training on selected physiological and anthropometric variables among school obese students in Tamilnadu. To achieve the purpose of the study, forty five school students from AJC Matriculation school, SBJ Matriculation school, SVK Matriculation school were randomly selected as subjects. The age of the subjects were ranged between 14 and 17 years. The study was formulated as a true random group design, consisting of a pre-test and post-test. The selected subjects were divided into three groups of fifteen each. Group I underwent aerobic exercises for twelve weeks (for five days a week). Group II underwent weight training for twelve weeks (for five days a week). Group III acted as control group that did not participate in any special training programme apart from their regular physical education programme as per their curriculum. After completion of the subject belonging to all the three groups were again tested on criterion measures as measured during the initial test. To find out the difference between pre and post test of each groups, paired 't' test was used. Analysis of covariance (ANCOVA) was computed because the subjects were selected random but the groups were not equated in relation to the factors to be examined. The scheffe's post-hoc test was administered to find out the paired means difference to test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study. The results of the study indicates that the experimental groups namely aerobic exercise group and weight training group had shown significant

improvement on selected physiological and anthropometrical variables among school obese students.

Keywords: Aerobic exercise, weight training, Obesity

INTRODUCTION

Aerobic exercise (also known as cardio) is physical exercise of low to high intensity that depends primarily on the aerobic energy-generating process. Aerobic literally means, "relating to, involving, or requiring free oxygen," and refers to the use of oxygen to adequately meet energy demands during exercise via aerobic metabolism. Generally, light-to-moderate intensity activities that are sufficiently supported by aerobic metabolism can be performed for extended periods. Doing aerobics regularly can decisively improve heart rate, body condition, and state of mind. Aerobic exercise gets the heart working to pump blood through the heart more quickly and with more force than normal. As blood is pumped faster, it must be oxygenated more quickly, which quickens respiration. Aerobic exercise strengthens the heart and boosts healthy cholesterol levels. Over 20 years of research has shown that aerobic exercise is one of the best exercises. Aerobics conditions heart and lungs, helps to use oxygen more efficiently and help control weight and reduce stress. Aerobics helps relax tense muscles, and a regular aerobics activity increases the body's production of endorphins (a natural sedative) and catecholamine (chemical substances that help stabilize moods). Aerobic capacity refers to the maximum amount of oxygen consumed by the body during intense exercises, in a given time frame. Weight training is a common type of strength training for developing the strength and size of skeletal muscles. It uses the weight force of gravity (in the form of weighted bars, dumbbells or weight stacks) to oppose the force generated by muscle through concentric or eccentric contraction. Weight training uses a variety of specialized equipment to target specific muscle groups and types of movement. The World Health Organization (WHO) states "childhood

obesity is one of the most serious public health challenges of the 21st century.” The incidence of childhood obesity has tripled during the past thirty years, and WHO estimates that, at least 22 million children under age five and 155 million aged five to seventeen were affected worldwide. In response to this alarming trend, WHO, other international and regional health agencies have initiated programs to prevent children from becoming overweight or obese. Although the terms overweight and obese are sometimes used interchangeably, health experts generally distinguish the two conditions by defining overweight as increased body weight relative to height based on standard height-weight tables, and obese as having an excessive amount of body fat compared to lean body mass. Research has shown that both conditions contribute to numerous health problems. Fortunately, says WHO, overweight and obesity, as well as their related chronic diseases, are largely preventable. Governments, international partners, civil society and the private sector have vital roles to play in shaping healthy environments and making healthier diet options affordable and easily accessible. However, implementing preventive measures for childhood obesity is not a simple matter. Environment, behavior, and genetics all play roles in this epidemic, and most experts agree that obesity is a social problem as well as an individual medical issue. This means that many factors must be addressed when seeking prevention strategies. Just a few of the environmental, behavioral, and social factors that researchers believe should be confronted are increased television and computer use; fewer physical activity programs in schools; suburban growth and urban crime that deter children from playing outdoors; and parents who offer high-salt, high-fat frozen meals or fast food to their children because they are too busy to prepare nutritious meals.

MATERIALS AND METHODS

The purpose of the study was to find out the effect of aerobic exercises and weight training on selected physiological and anthropometric variables among school obese students. To achieve the purpose of the study, forty five school students from AJC matriculation school, SBJ matriculation school, SVK matriculation school were randomly selected as subjects. The age of the subjects were ranged between 14 and 17 years. The selected subjects were divided into three groups of fifteen each. Group I underwent aerobic exercises for twelve weeks (for five days a week). Group II underwent weight training for twelve weeks (for five days a week). Group III acted as control group that did not participate in any special training programme apart from their regular physical education programme as per their curriculum. The subjects were free to withdraw their consent in case they feel any discomfort during the period of the training programme. There was no such drop out in the study. The study was formulated as a true random group design, consisting of a pre-test and post-test. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. Group I underwent aerobic exercises for twelve weeks (for five days a week). Group II underwent weight training for twelve weeks (for five days a week). Group III acted as control group that did not participate in any special training programme apart from their regular physical education programme as per their curriculum. The reliability coefficients are significant at 0.05 levels of all the tests under investigation which had more than 0.63

STATISTICAL ANALYSIS

The following statistical techniques were adopted to treat the collected data in connection with established hypothesis and objectives of this study.

To find out the difference between pre and post test of each groups, paired 't' test was used. Analysis of covariance (ANCOVA) was computed because the subjects were selected

random but the groups were not equated in relation to the factors to be examined. Hence the difference between means of the three groups in the pre-test had to be taken into account during the analysis of the post-test differences between the means. This was achieved by the application of the analysis of co-variance, where the final means were adjusted for differences in the initial means and the adjusted means were tested for significance.

Whenever the adjusted post-test means were found significant, the scheffe's post-hoc test was administered to find out the paired means difference to test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study.

RESULTS OF THE STUDY

TABLE

ANALYSIS OF COVARIANCE OF THE DATA ON BODY FAT OF PRE, POST AND ADJUSTED POST TESTS SCORES OF CONTROL AND EXPERIMENTAL GROUPS (IN SECONDS)

| Test | ATG | WTG | CG | SOV | SS | df | MS | F-ratio |
|---------------------------|-------|-------|-------|------------|---------|----|--------|---------|
| Pre-test | | | | | | | | |
| Mean | 63.66 | 64.33 | 64.00 | B.M | 3.333 | 2 | 1.667 | 0.60 |
| SD(±) | 1.63 | 1.79 | 1.55 | W.G | 116.667 | 42 | 2.778 | |
| Post –test | | | | | | | | |
| Mean | 59.40 | 62.66 | 64.13 | B.M | 176.133 | 2 | 88.067 | 40.79 |
| SD(±) | 1.45 | 1.87 | 0.91 | W.G | 90.667 | 42 | 2.159 | |
| Adjusted post-test | | | | | | | | |
| Mean | 59.61 | 62.45 | 64.13 | B.S | 155.149 | 2 | 77.574 | 72.03 |

| | | | | | | | |
|--|--|--|--|------------|--------|----|-------|
| | | | | W.S | 44.151 | 41 | 1.077 |
|--|--|--|--|------------|--------|----|-------|

*significant at 0.05 level of confidence

(The table values required for significance at 0.05 level of confidence for 2 & 42 and 2 & 41 are 3.22 and 3.23 respectively).

ATG- Aerobic training group

WTG - Weight training group

CG- Control group

SOV – Sum of variance

SS - Sum of Squares

df – degrees of freedom

MS - Mean Square

B.M – Between means

W.G – Within groups

B.S – Between sets

W.S – Within sets

The table shows that the pre-test mean values on body fat of aerobic training group, weight training group and control groups are 63.66, 64.33 and 64.00 respectively. The obtained 'F' ratio 0.60 for pre-test scores was less than the table value, 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on body fat. The post-test mean values on body fat of aerobic training, weight training group and control group are 59.40, 62.66 and 64.13 respectively. The obtained 'F' ratio 40.79 for post-test scores was greater than the table value 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on body fat. The adjusted post-test means of aerobic training, weight training group and control group are 59.61, 62.45 and 64.13. The obtained 'F' ratio of 72.03 for adjusted post-test means was greater than the table value of 3.23 for df 2 and 41 required for significance at 0.05 level of confidence on body fat. The results of the study indicated that there was a significant difference among the

adjusted post-test means of aerobic training, weight training group and control groups on body fat.

The pre, post and adjusted post-test means values of aerobic exercise group, weight training group and control group on body fat are graphically represented in the figure

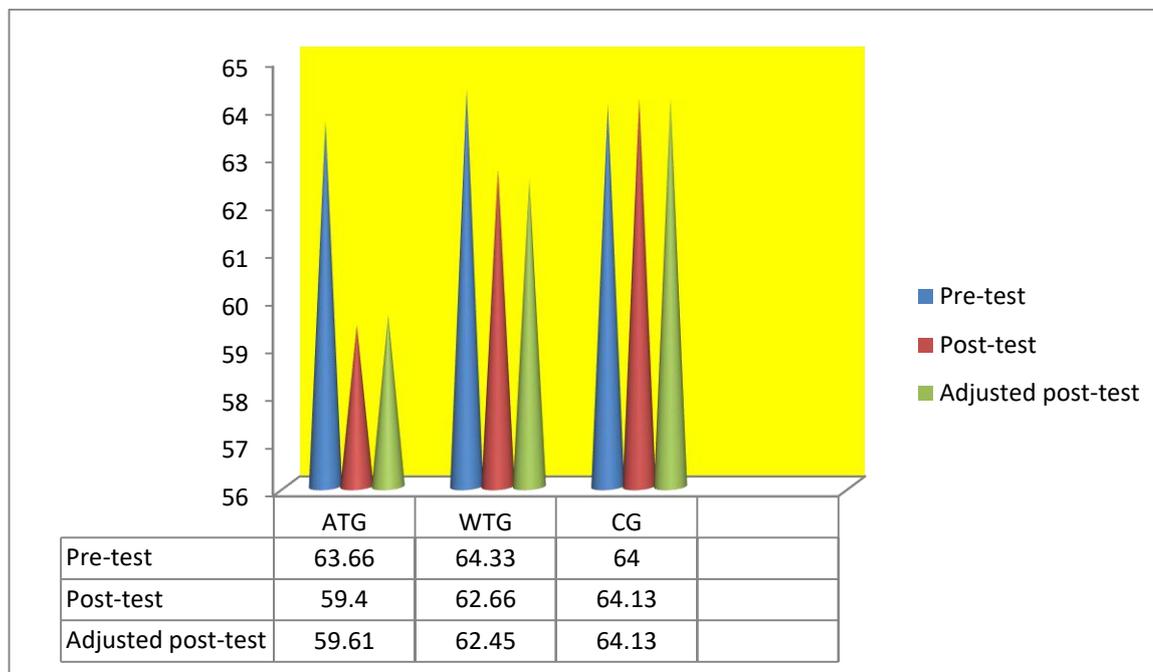


Figure-The graphical representation of the pre, post and adjusted post-test means values of aerobic training group, weight training group and control groups on body fat.

Discussion on findings

The results of the study indicates that the experimental groups namely aerobic exercise group and weight training group had shown significant improvement on selected physiological and anthropometrical variables among school obese students. The aerobic exercise group had shown significant improvement in all the selected physiological and anthropometric variables after undergoing the aerobic exercise for a period of twelve weeks. The weight training group had shown significant improvement in all the selected physiological and anthropometric variables after undergoing the weight training for a period of twelve weeks. The control group had not shown significant changes in any of the selected variables. The aerobic group had

shown significant improvement in all the selected physiological and anthropometric variables than the weight training group.

The result of the investigation also supported by the following studies of Fatma, et al., (2016), Frappier, et al., (2015), Mcguigan, et al., (2009)

Conclusion

From the analysis of data, the following conclusion were drawn

1. The experimental group “A” had shown significant improvement in all the selected physiological and anthropometric variables after undergoing the aerobic exercise for a period of twelve weeks.
2. The experimental group “B” had shown significant improvement in all the selected physiological and anthropometric variables after undergoing the weight training for a period of twelve weeks.
3. The experimental group “C” had not shown any improvement in the selected physiological and anthropometric variables.
4. The aerobic group had shown significant improvement in all the selected physiological and anthropometric variables than the weight training group.

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